

# COAL MINING

*"The Picture-Book of the Industry"*

DECEMBER 1949

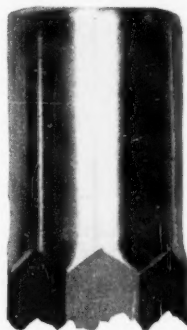
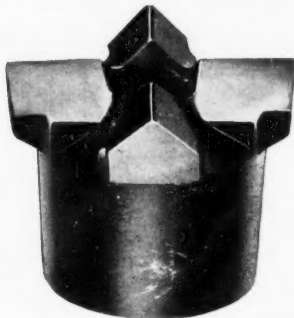
VOLUME XXVI, No. 12

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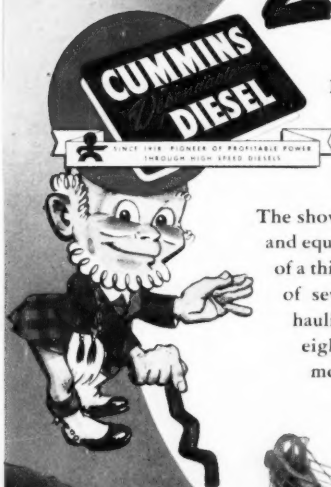
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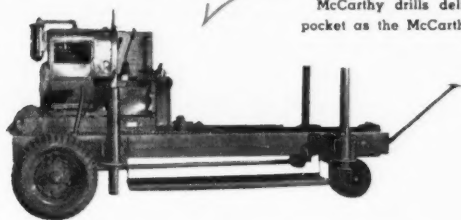
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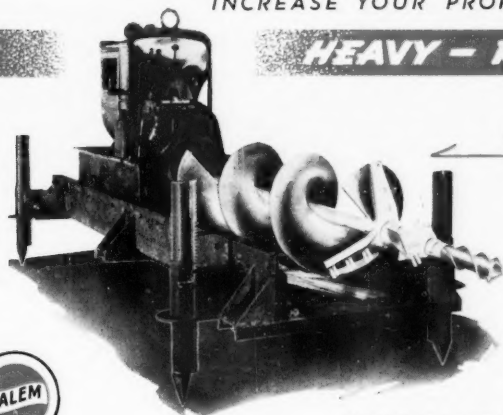
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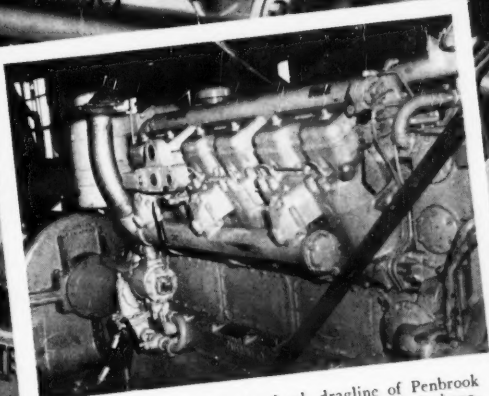


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The D397, installed in the 6 yd. dragline of Penbrook Contr. Co., was equipped with a heavy-duty herringbone-gear reducer for power transmission and a "Caterpillar" air starting system. All controls are at one central location for ease in operation.



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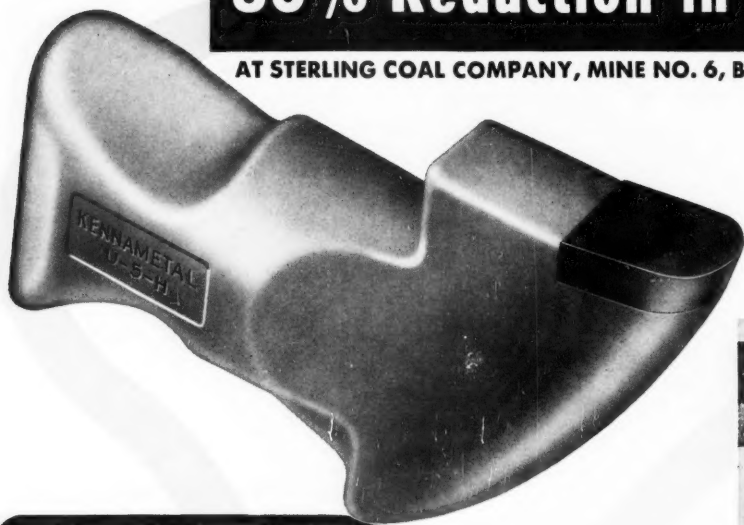
The D397 is one of 4 new engines in the "Caterpillar" line. 500 maximum, 450 rated and 400 continuous horsepower ratings is the output of this engine. Other engines in the line of dependable power include:

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D318.....	103 max. H.P.
D315.....	70 max. H.P.
D311.....	52 max. H.P.

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Tonnage/Set of 42 Bits.....	133	24,700
Number of Bits Needed to Cut 24,700 Tons (1300 places)	7,800	42
Bit Cost for 24,700 Tons.....	\$347.00	\$50.40
Bit Cost per Ton.....	\$.0140	\$.0020
<b>Bit Cost Reduced 86%</b>		
Bit Changes (1300 places).....	186	2
<b>Bit Changing Reduced 98.9%</b>		

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Equally important, in terms of savings, is the fact that Kennametal Bits require

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At the Sterling mine, the life of Kennametal Bits is 186 times that of conventional bits. 500 places are cut with Kennametal Bits before resharpening—in cutting 24,700 tons, only two resharpenings were needed.

Production can be increased... overall operations improved by cutting in less time at less cost, with Kennametal Cemented Carbide Bits. Read the summary at the left, which is typical of the savings. Consider what this would mean in your mine. Write today for further particulars. Mining Division, Kennametal Inc., Latrobe, Pa.

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# COAL MINING

Vol. XXVI

DECEMBER, 1949

No. 12

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Published Monthly By  
**MODERN MINING PUBLISHING COMPANY**

Publication Office, 5403 Clairton Boulevard,  
Pittsburgh 27, Pa.

Editorial Offices, 5403 Clairton Boulevard,  
Pittsburgh 27, Pa.

P. F. JASIK, Publisher and Editor  
WILLIS S. DRAKE, Sales Manager  
J. E. RIEHLE, Production Manager

Subscription Price:—In the United States, \$1.25 per year; all other countries, \$2.00. Single copy, 20 cents.

All Forms 3578 To Be Sent to 5403 Clairton Blvd.,  
Pittsburgh 27, Pa.

"Entered as second-class matter at Pittsburgh, Pa."

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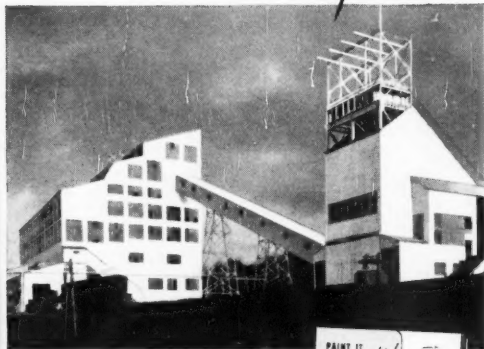
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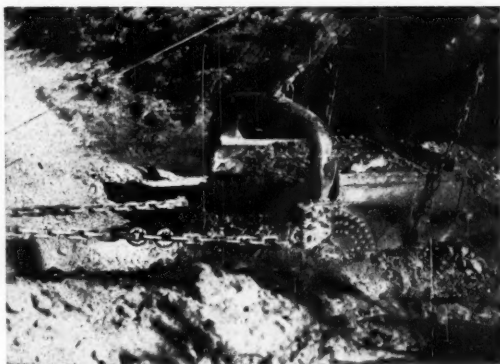
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Dump Blocks and Shackles • Hazard Wire Rope

## DO YOU KNOW

\* \* \*

Psychologists at the University of California are preparing a unique approach to the study of man: they will try to learn why men succeed instead of why they fail.

To carry out this task, an Institute of Personality Assessment and Research, funded by \$100,000 from the Rockefeller Foundation, has just been established on the Berkeley campus.

Head of the new institute is Dr. Donald W. MacKinnon, a key figure in the wartime personality assessment program of the Office of Strategic Services, which was famed for its methods of selecting men for specialized and hazardous overseas missions in World War II.

Dr. MacKinnon points out that little attention has been devoted to learning why men are able to succeed and even to capitalize on their psychological problems.

"We hope to discover the factors that produce adjustment, happiness and effective living," Dr. MacKinnon said.

\* \* \*

A lot of accepted ideas about tests to select workers for various occupations have been exploded in a study by Dr. Edwin E. Ghiselli, professor of psychology at the University of California. For one thing, the result of a single test is seldom sufficient evidence for predicting whether an individual is suited for a particular kind of job. Whole batteries of tests will have to be developed if reasonable accuracy is to be achieved in personnel selection.

Dr. Ghiselli bases this conclusion on an evaluation of test scores for various occupations as compared with actual proficiency. The validity of the tests was only "moderate or low."

The psychologist also questioned the idea that intelligence tests are more effective in the "higher" than in the "lower" occupations. For example, the tests show up better in picking skilled workers than in picking salesmen.

The psychologist studied results of testing in seven categories of occupations: clerical, sales, supervisory, protective service, skilled, semiskilled and unskilled. He obtained his data from psychological and technical reports from industry and governmental agencies. His results are published in a monograph by the University of California Press.

\* \* \*

The installation of air cleaners on car body and engine air intake helped in extending the period between overhauls up to 1,000,000 miles in the case of diesel engines on a major railroad, the Society of Automotive Engineers was told recently by James Myers, of the Farr Company, Los Angeles.

The use of air cleaners reduces both engine wear and operating costs, he said. However, the equipment must be selected on the basis of operating requirements, installation possibilities and cost factors. In cases involving unusually heavy accumulations of dust, and of plant by-products in the air, samples should be submitted to the filter manufacturer so that the proper filter may be used.

## Here and There . . . .

\* \* \*

Andrew B. Crichton, Jr., and W. D. Hughes were elected Vice-Presidents of the Johnstown Coal & Coke Company. E. M. Ellenberger was named Assistant Secretary-Treasurer. Officers re-elected of this company are John W. Walters, Chairman, Board of Directors, Andrew B. Crichton, President, Harry A. Crichton and Walter G. Crichton, Vice Presidents, C. W. Crichton, Secretary-Treasurer, John E. Evans, General Counsel, Martha C. Curry, Assistant Treasurer.

\* \* \*

Officers of the New River Coal Operator Association for the ensuing year are as follows: President, J. M. McCauley, New River Co.; Vice President, L. C. Campbell, Coal Division, Eastern Gas & Fuel Associates; Treasurer, P. M. Snyder, and Secretary-Traffic Manager, Stanley C. Higgins. L. Ebersole Gaines, President of the New River Company, and L. C. Campbell were named directors on the board of the Southern Coal Producers Association, and R. H. Morris and P. P. Kerr were named as directors on the board of the West Virginia Coal Association.

\* \* \*

Oglebay Norton & Company has opened another coal mining property in the Ohio No. 8 field which will be known as the Saginaw Mine.

The Saginaw Mine is located in Belmont County just outside of St. Clairsville, Ohio, and is on the Wheeling & Lake Erie Railroad. Total reserves of Ohio No. 8 coal in this property are estimated at 20 million tons.

\* \* \*

Mr. H. A. Quenon will be manager of Federal No. 1 mine at Grantown, Marion County, West Virginia. Melcroft and Sonman mines in Pennsylvania. His headquarters will be at Grantown, Pennsylvania.

\* \* \*

W. D. Hawley, formerly superintendent of the Helen mine, has succeeded Mr. Thatcher as General Superintendent of all the Raleigh County mines. Joseph H. Benedict, Resident Engineer of the Helen No. 9 and Stotesbury No. 11 mines will be superintendent of the Helen mines. Mr. Squire R. Barrett, Mining Engineer at Eccles mines has been advanced to Joseph H. Benedict's former position.

Mr. L. C. Campbell, Vice President of Eastern Gas & Fuel Associates, has announced the following changes in operating management of the coal mining division. Mr. Albert Evans will be in charge of the nineteen mines. Mr. John Harper will



M. L. Workman

\* \* \*

assume duties as Assistant to Mr. Campbell. Mr. M. L. Workman, formerly superintendent of the Helen Mine in Southern West Virginia, will be manager of the Helen, Stotesbury, and Eccles mines in Raleigh County, W. Virginia, and Keystoae, Carswell, and Maitland mines in McDowell County, West Virginia. His new headquarters will be at Bluefield, West Virginia.

\* \* \*

Mr. A. P. Boxley will be manager of Kopperstown mine in Wyoming County, West Virginia. Wharton mine in Boone County, West Virginia, and Weeksbury mine in Kentucky and Powellton, Beards Fork, and Midvale mines in Fayette County, West Virginia.

\* \* \*

S. H. Thatcher, General Superintendent, Raleigh Mine, Raleigh County, West Virginia, has been transferred to the McDowell County mine and will headquarter at Kimball, West Virginia.



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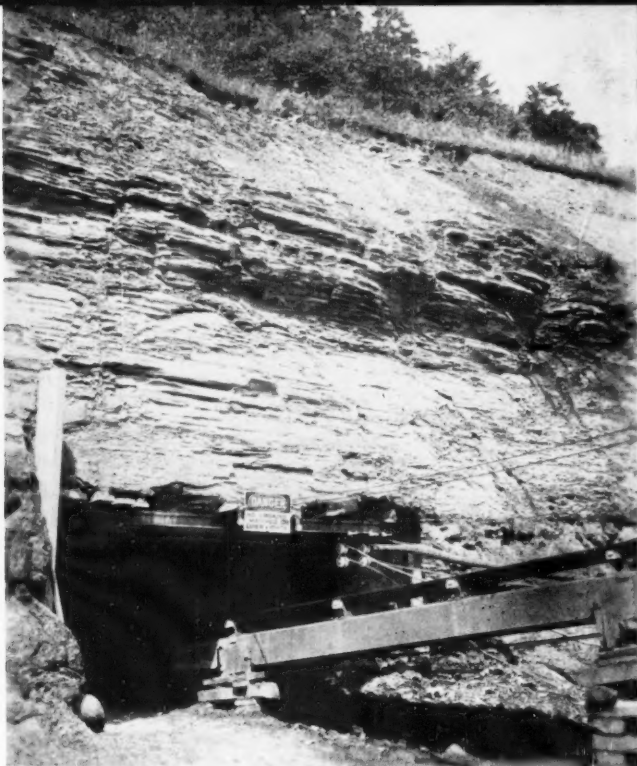
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Outcrop section shows laminated shale that covers the seam.



## Roof Bolting In The Elkhorn No. 3 Seam

By L. D. SINIFF

*Mechanical & Electrical Engineer Consolidation Coal Company (Ky.)*

During the fall of 1948 it was decided to make a trial of roof bolting in the Consolidation Coal Company (Ky.) Mine 214 at McRoberts, Ky., to determine the feasibility of holding the roof in the Elkhorn No. 3 Seam. Normally it is necessary to hold this by means of cross bars.

The roof of the Elkhorn No. 3 seam in this area is of very poor quality; that is, it is of weak structure and has no definite flat laminations and after exposure loosens and falls in flat wedge shaped pieces. When supported on cross-bars it often loosens to heights where the bars will not

support it, and has to be taken down. The thickness of this type roof is greater than that of the coal seam.

A trial of supporting the roof by means of bolts was conducted for a distance of ten cuts, with bolts placed on 4 foot centers in either direction. These homemade bolts of 1 inch cold



Conventional type of timbering before roof bolting. Bars allow roof to sag and slack. (Note) No definite lamination results in odd shapes as roof rests on cross bars.



Another view of conventional type of roof timbering showing crack in the roof.



One result of conventional roof support after cracking has begun.



A later result of conventional roof support after cracking.

rolled steel, 54 inches long, slotted on one end and threaded on the other for a distance of 6 inches, were made in our Central Machine Shop. Wedges  $1\frac{1}{2} \times 6$  feathered on the thin end were sawed from bar stock. A Chicago Pneumatic 572 coal drill was mounted on the lifting support of a Simplex timber jack so the jacking action could be used as a feed. Conventional twisted steel, blacksmith sharpened augers were used to drill  $1\frac{1}{4}$  inch diameter holes 52 inches in depth. The bolts were driven up on the wedges by means of a 10 lb. sledge. A home-made dolly was screwed on the end of the bolt to protect the threads while driving. An  $8 \times 8 \times \frac{3}{8}$  plate or shine plaster was used above the nut,

the nut then being tightened by means of a 19 inch ratchet wrench of the type used on shaker conveyor.

Obviously this method was very crude and slow. However, the results were most encouraging. The roof soon fell on both inby and outby sides of the bolts but stayed in place where the bolts were installed. It may be of interest that this roof is still standing today when falls up to 5 feet on either side.

On the strength of the encouraging results of the first experiment it was decided to experiment further. Fifty tons of 1 inch round stock were ordered and the Central Shop put to work at slotting and threading the bolts and cutting wedges.

Fairview No. 1 Section at our 204

mine at Marshalls Branch was selected because of its convenience. At the conclusion of the paper, I shall show slides of this mine and the equipment herein described. This is an outcrop mine and was, at that time, only in about 500 feet. The equipment in this section consisted of a Sullivan 11RU cutter, Joy 14BU loader, and two Joy 6SC shuttle cars discharging onto the end of a Goodman 97 HCD, 30 inch belt. The drive and headpiece of the belt are on the outside where it discharges into Differential Steel Car Company 12 ton mine cars. A Brown-Fayro HM double barney hoist handles the cars at the loading point. Five entries were being driven and rooms worked on the left hand side as the



Left:—Makeshift . . . Hand drill is suspended in makeshift saddle on Baker Timber Setter boom. Center:Placing Wedge Bolts in Hole . . . Wedge is inserted in end of bolt and then bolt driven up on wedge anchoring the bolt by expanding slotted end at top of hole. Bolts can be placed close to the face and are not subject to being knocked out when coal is shot. Right: Driving Bolt Up On Wedge . . . The spike driving hammer provides a quick easy means of driving the bolt up on the wedge. Care must be taken to be sure the bolt is driven home. It is important to drill the hole in the proper depth.



Bolts held laminations together so air slacking cannot take place. Good roof results where had was formerly encountered.



A close-up view of roof bolting in roadway.

mine advanced. The mine was to be driven 2000 ft. and the rooms on the right worked on the retreat.

The bolting experiment was to be conducted in the two right hand entries independent of the mining operation. Timbering which consisted of 60 lb. rails on posts spaced on 5 foot centers, was to be continued in the conventional manner. Since the extreme right hand entry would not be needed until on retreat it was possible to remove the cross bars to determine how the bolts would hold.

From this experiment a Sullivan SA91 stoper was used for drilling as well as driving the bolt up on the wedge, and a Chicago Pneumatic 365 impact wrench for tightening the nuts. Since the smallest jack bits available were  $1\frac{3}{8}$ ", this necessitated changing the size wedges to  $3\frac{1}{4} \times 3\frac{1}{4}$ ". At first coal ranged in height from 55 to 70 inches but soon we encountered rolls and the height dropped to as low as 44 inches making it necessary to cut the bolt length

from 54 to 44 inches. As you may imagine, the lower coal caused an acute drilling problem due to the length of the stoper we were using at that time, and the frequent drill steel changes required. Fortunately, the Cleveland Pneumatic Tool Company was developing two new special short type stopers and their representatives worked very closely with us in getting started on bolting in this new height. Drilling with the stoper made it necessary for the operators to wear respirators. We had complaints from the other workers on the section about dust being carried by the air to them.

We attempted to solve this problem by going to wet stoper drilling, but found our difficulty lay in another direction because we had trouble in keeping men on this job due to their getting wet from the water splashing as it came from the hole, and from kneeling on the wet bottom.

It was obvious from the start that rotary drilling was faster than per-

cussion in our shale roof but since it was necessary to have air for driving the bolts and tightening the nuts, air was tried first. In order to make an all electrical setup we purchased an electric hammer and an electric nut runner, both of open type, and of the type normally used for assembly line work. While they did a fair job for us, they were not the proper tools, and definitely were not suited for mine service. This experience resulted in a compromise of electric rotary drilling, with air for driving the bolts and tightening the nuts, which, of course, was far from an economical means of carrying on the experiment.

In order to speed the drilling time it was decided to mount the drill in a saddle made to fit on the end of the boom of a battery operated Baker Timber Setting Machine, the operator using the horizontal boom extension motion to compensate for the arc made as the boom was raised. Considerable thought was given to a

(Continued on Page 23)



Freedom of Timber . . . With cross bars and props eliminated, men and equipment can travel safely. This contributes materially to the increase in production realized in bolted roof sections.



Converted Timber Setter . . . No longer needed to set cross-bars this Baker Timber Setter has been made into a make-shift vertical drill. The lifting motion acts as a feed, while the horizontal motion corrects for the arc as the boom is raised.



Over-all view of equipment used at the operation.

## Augers Recover Coal Left In Strip Mine Highwalls

In the period of war emergency, the coal bearing area in Eastern Ohio has been strip mined with the best stripping equipment available at that time. From the standpoint of economy, however, the equipment was not always of the type that would move the maximum amount of overburden to permit recovery of the possible maximum amount of the coal.

The Grinner & Elwonger Coal Company, near East Palestine, Ohio, has an option on fifty miles of strip mine highwall in that area and is recovering some of the coal by using a 24 inch auger to bore 120 feet deep holes into the coal lined under

overburden too high to move with stripping shovels.

The coal seam averages 42 inches thick. Its structure is fairly hard and it contains a one-quarter inch bearing-in band near the center of the seam.

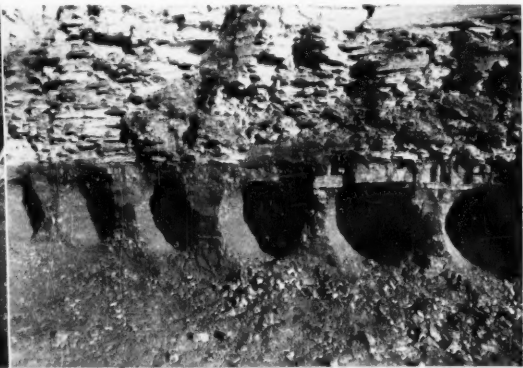
The drilling equipment (including augers) was built by the Salem Tool Company and consists of a drilling unit powered by a Ford V-8 industrial type engine, and the augers and two cutting heads. The unit develops a maximum hydraulic pressure of 650 lbs. Other equipment consists of a small gasoline engine driven conveyor and haulage truck. Only one

cutting head was used when the operation was started, but that required the removal of all the auger sections from the 120 foot deep borings to get the head for making the next hole. By using an extra cutter head a new hole can be started and sections of the auger pulled from the previous hole as needed, thus eliminating the useless handling of the augers which would be necessary to recover the cutter head if only one head was used.

This operation is carried on by two men who produce an average of 50 tons per day and recover 48% of coal in the 120 foot deep area being mined.



Drilling unit pulls Auger out of previously drilled holes as sections are needed in boring new hole.



Face of coal in the high wall after the unit has recovered the coal.





Operator sumping Colmol into face, making  $9\frac{1}{2}$  foot cutting face.



View from opposite side when making second  $4\frac{1}{2}$  foot cut to widen room. Note face in first cut.

## NEW JEFFREY COLMOL

A re-designed low vein Jeffrey Colmol was demonstrated to editors of Mining Journals and National News Magazines, at the coal strip mine of the Sunnyhill Coal Company, near Lexington, Ohio, on the afternoon of November 3.

This new Colmol was built to work in coal seams ranging from 30 to 40 inches in thickness. It was demonstrated in a strip mine high wall exposing the Ohio No. 6 seam that averages 46 inches thick, and which is correlated with the Middle Kittaning coal in Western Pennsylvania. The coal is of a hard structure, and contains a quarter inch

bearing-in band in about the middle.

The frame of this new machine has been re-designed and streamlined. Cut cutting head of this model, like on the first model, makes a  $9\frac{1}{2}$  foot wide cut, has two rows of breakers, each having one 3-pronged pilot bit in the center, and three 2-pronged radius bits. These lower breakers make a 14 inch cut. The upper row consists of ten breakers having a 3-pronged pilot bit and one radius bit. These breakers make a 10 inch radius cut, and give a fairly smooth roof.

All bits on the breakers are Tungsten Carbide tipped.

By substituting a larger gear case

for the breakers and using ten 9 inch radius breakers in the top row, this machine will mine a seam of coal ranging from 33 to 42 inches.

This new Colmol is electro-hydraulically driven by three 50 horse power motors. The control mechanism is approximately the same as on the first Colmol.

The Caterpillar treads are of the rugged Bulldozer type. Over-all height is 28 inches. Length is 23 feet. At operators seat the width is 66 inches. Width over crawlers is 75 inches. Width of the three section conveyor is 45 inches. Weight of the entire unit is 23 tons.



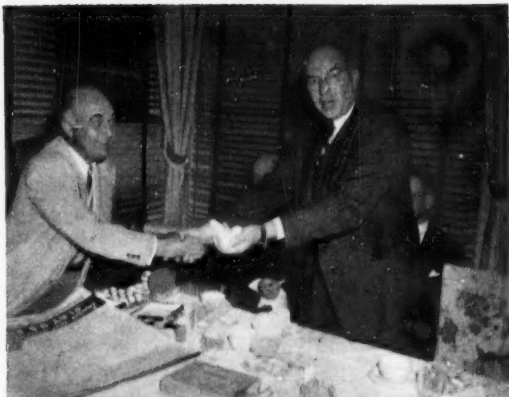
Close up of a face cut by the Colmol



This is the suggested standard for roof timbering over the Colmol.

# September 22, Meeting Of The Western Pennsylvania Bituminous Coal Operators Golf Association

Another meeting of the Bituminous Coal Operators Coal Association of Western Pennsylvania was held at the Nemacolin Country Club on Thursday, September 22.



Johnny Capabianco, Golf-Pro at the Nemacolin Club, handing Homer Chalfont, General Superintendent, Marriana Division of the Bethlehem Steel Company, three golf balls as a prize.



George Burenger, Liberty Powder Company, Joe McVicker Mining Engineer, Republic Steel Corp., L. H. Loufek, Central District, Industrial Manager, Westinghouse Electric Corporation.



B. A. Dennis, Sales Representative, DuPont Powder Company, A. W. Dartnell, Superintendent, Gibson Mine, Hillman Coal & Coke Company.



W. E. Hess, General Superintendent, Vesta Coal Co., George McKenna, State Mine Inspector, and W. G. Stevenson, General Manager, Hillman Coal & Coke Co.



Cliff Dickson, Expeditior, Pittsburgh Steel Company, and J. H. Phillips, General Purchasing Agent, Pgh. Steel Corp.



Left to right: C. G. Strote, Purchasing Agent, H. C. Frick Coke Company, H. L. Williams, Victoria Coal Company, and L. U. McAndrews, Purchasing Dept., Pgh. Steel Co.



Joseph Smith, Purchasing Agent, Pittsburgh Steel, and Leo Kramer, Superintendent, Coke Plant, Pittsburgh Steel.

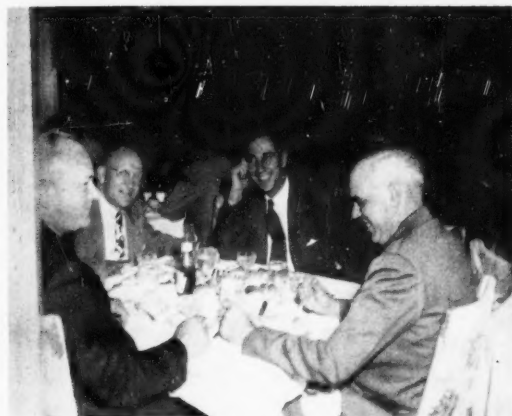
This was the last meeting of the 1949 season of this Association on that course. The final meeting of this season was held at the Uniontown Country Club.

The September 22 meeting at the

Nemacolin Country Club was well attended, not only by playing golfers but by guests as well, who came for dinner only.

Color motion pictures of the previous meeting, held at the Greene

County Country Club, which were taken by COAL MINING, were shown for the first time at this meeting and furnished amusement for those golfers whose pictures were on the screen as well as for their friends.



Left to right: Bill Schiffbauer, Mine Foreman, Buckeye Coal Company, Nemacolin, Pa., Edgar R. Phillips, Sales Manager Pittsburgh Gear & Machine Company, McLanahan, McLanahan-Stone Corporation, and Less Simpson, Sales Representative, Hulbert Oil & Grease Company.



Left to right: Thomas C. Pratt, Master Mechanic, Vesta Coal Company, Harry D. Kingsley, Sales Engineer, General Electric Company, B. R. Walburn, Superintendent, Electrical Dept., Vesta Coal Company, and R. C. Meredith, Sales Engineer, General Electric Company.

The appointment of Robert L. Frazer as Joy representative in Spokane has been announced by Joy Manufacturing Company, Pittsburgh, Pennsylvania.

A 1942 graduate of the Montana School of Mines, Mr. Frazer took his degree in Mining Engineering. He has been an engineer with U. P. Coal Company in Rock Springs, Wyoming, Potash Company of America in Carlsbad, New Mexico,

and the Freeport Sulphur Company in Freeport, Texas, successively.

A veteran of World War II, he spent his service time under the Southwest Pacific as a submarine engineer, occasionally coming up at his base in Australia.

Mr. Frazer is located at 1118 Ide Avenue in Spokane.

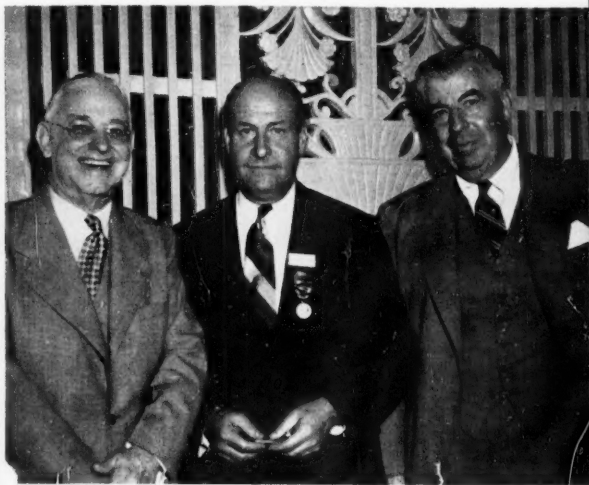
\* \* \*

A new 12-page bulletin on "Roof-Bolting" has been released by the Joy

Manufacturing Company, Henry W. Oliver Building, Pittsburgh 22, Pa. The bulletin describes the equipment required and the methods used for this latest system on the requirements which determine the selection of the drilling equipment most suited to any particular condition. Equipment and methods referred to in the bulletin are illustrated by photographs and line drawings. Complete specifications are included.



R. L. Ireland, President, Hanna Coal Company, and R. C. Mulligan, Director of Public Relations, Bituminous Coal Institute.



E. H. Davis, President, New York Coal Co. Newly elected Treasurer, NCA, R. H. Knode, President, Stonega Coke & Coal Company, newly-elected President NCA, and W. C. Shank, President, Crowe Coal Company, newly-elected Vice-President, NCA.



Hugh B. Lee, Vice-President & General Manager, Maumee Collieries, and J. W. Damron, Chairman of Board, Red Jacket Coal Company, at the N. C. A. Waldorf-Astoria Convention.

## National Coal Association Holds Annual Meeting In New York City

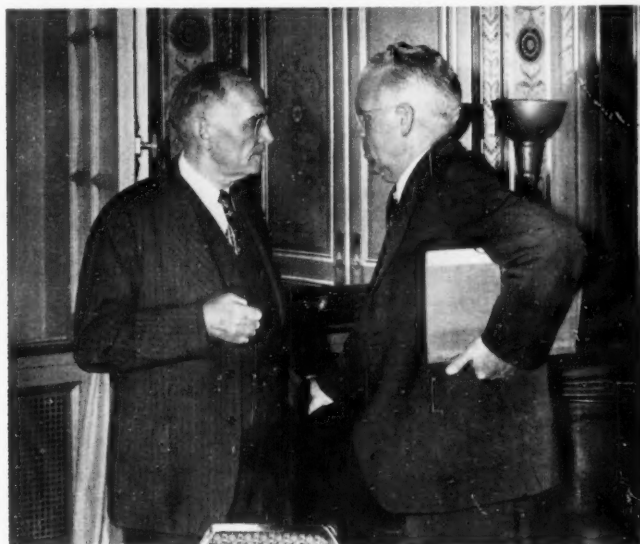
Approximately six hundred leaders of the Bituminous coal mining industry met at New York City on October 5, 6 and 7. Mr. Ralph H. Knode, President of the Stonega Coke & Coal Company, Philadelphia, Pa., was elected President of the Association, succeeding Mr. Charles A. Owen, President of the Imperial Coal Corporation of New York City.

Discussions of the meeting pertained to the past years of the Bituminous Coal Institute, of the Bituminous Coal Research, Inc., and of the Coal Heating Service, Inc. Advances made in the past year were reviewed. A newly-launched series of regional meetings, the issuance of a Better Bulletin Service and a program of Increased Research, Education & Public Relations by the Association have been stressed by Mr. Owen, retiring President.





Speaker: Charles A. Owen, President, Imperial Coal Corporation.



J. D. Francis, Chairman of the Board, Island Creek Coal Company; and L. C. Campbell, Vice President, Coal Division, Eastern Gas & Fuel Associates.



D. A. Thomas, President, Boothton Coal Mining Company, and Calvin Holmes, President, Holmes-Darst Coal Company.



L. Russell Kelce, President, Sinclair Coal Company, elected member of Executive Committee, and Hugh B. Lee, Vice President Maumee Collieries, elected a director.

A highly useful new book, "Prepare for Profit," has just been released by the Roberts and Schaefer Company, Chicago. Written in clear and concise fashion, the book is notable for its comprehensive treatment of up-to-date preparation methods and machines. Actual plants are

used to demonstrate, step by step, how typical preparation problems have been approached and solved.

In addition to the section showing how progressive design, sound engineering and durable construction have been the basis for more-profitable preparation . . . Prepare for

Profit describes and illustrates modern R & S preparation equipment and processes.

This informative new 20-page book (Bulletin No. 173) is available, without obligation, from Roberts and Schaefer Company, 130 North Wells Street, Chicago 6, Ill.

## Greene County Pennsylvania Chapter of the Electro-Mechanical Maintenance Association Meeting at

### Carmicheals, Pa.

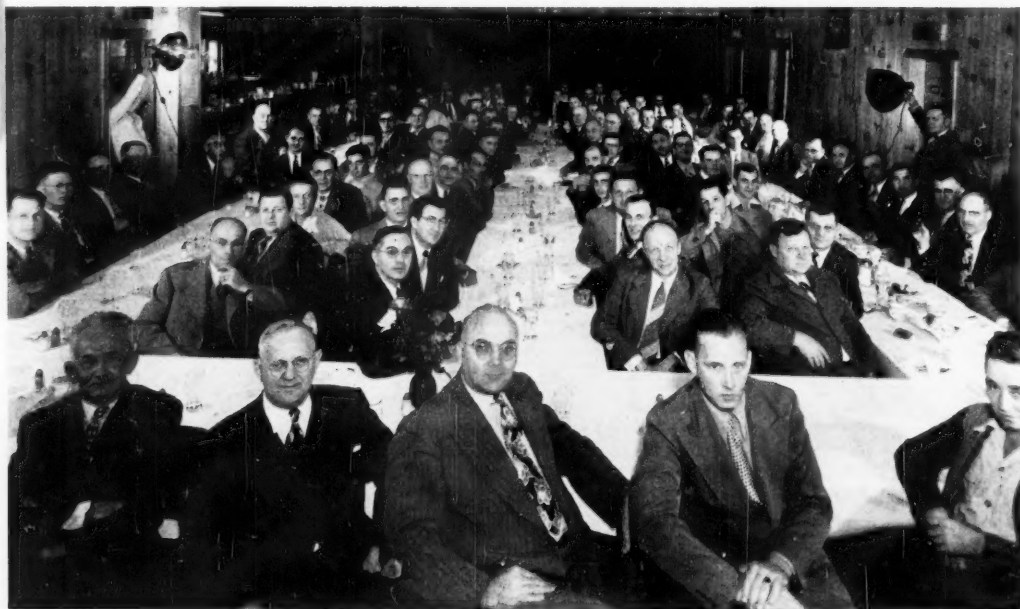
The Greene County, Pennsylvania, Chapter of the Electro-Mechanical Maintenance Association held a meeting, on October 12, at Carmicheals, Pa. The principal speaker of this meeting was Mr. A. E. Gordon, Sales Manager, Ventilation Division of the Jeffrey Manufacturing Company, Columbus, Ohio. The meeting was attended by 102 members of the Association and their friends. Mr. Gordon discussed the proper installation of new fans, sizes and type of fans, and fans to suit the characteristics of the mine.



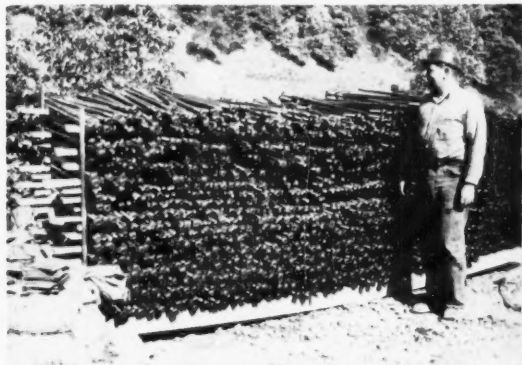
A. E. Gordon



Howard Miller



102 Members and their Guests attended the Meeting.



Timber Yard for Roof Bolting . . . Small space required and ease of locating close to point needed is another of the advantages of bolts over timber.



Old Timber Yard . . . Storage and transportation of bulky timber has always been a problem in the past.

### ROOF BOLTING

(Continued from Page 15)

straight line motion for the feed, but it was soon evident that the development of such a motion was a job for equipment manufacturers and not a coal producer. The coal drills soon proved too light for this duty as well as not being properly sealed against the dust that fell around the chuck and got into the gears. It was evident a larger motor and better sealed drive were required.

At present, a Joy 9J electric motor is being utilized. By using the gears that normally drive the hydraulic pump, we are able to get an auger speed of 900 rpm. The motor is mounted in a saddle on the end of the timbering machine boom. This piece of equipment is capable of drilling a 42 inch hole in about 1 3/4 minutes including one drill change.

Tungsten carbide tipped bits have been used for all rotary drilling. Standard diamond pointed masonry type 1 1/4" Kennadrills were welded onto 7/8" hex drill steels at the start with a flat taper shank forged to fit the chuck. Later manufacturers developed 7/8" round augers without scrowls with a 1 1/2" square female end to take the shank of the standard 2 prong 1 3/8 dia. bit. A special short twisted shank and chuck was developed to conserve the amount of height lost in making drill changes. A collar was added above the shank to act as a slinger and prevent the cuttings from falling into the chuck. It might be mentioned that when using 1 1/4" bits there was not sufficient space for the cuttings to fall out and binding often occurred.

I hope you will note the following significant fact:

Before bolting in the 2 entries had advanced 500 ft. the men were in

favor of discontinuing the setting of timber when bolts were used. The cross bars had been removed in the right hand entry as soon as mining had advanced so travel there was no longer necessary, which gave the men a chance to observe the results. The bolted area stood without failure while outby and in the adjacent entries the roof was heavy on the bars. By this time enough of the obvious problems of installing bolts had been mastered so that bolting could be used to hold its place in the mining cycle. The men were in favor of discontinuing any timbering because it increased the traveling height and eliminated the hazard of knocking out posts allowing the bars to fall. The enthusiasm of the men for bolted roof was very encouraging, and rightly so, for it had made a good roof out of a roof normally considered bad.

After observing these excellent results the next step was to experiment to determine the possibility of increasing the open area in rooms. The general practice had been to drive 5 rooms up at a time, the rooms being driven less than 18 feet wide using 14 ft. cross bars on 5 ft. centers. With roof bolts it was hard to keep from widening out until further experience was gained. In each of two groups of rooms a trial was made of cutting two rooms together after reaching the first cross cut, thus eliminating the pillar between them the remaining distance. This made a room 40 ft. wide without a stick of timber which was unheard of in the Elkhorn seam in this area. In order to avoid trouble from possible squeeze, the driving of rooms on the advance was abandoned. The entries were driven up their distance and the rooms worked out on the retreat. Projections of rooms 30 ft. wide

were made and worked out in groups of 5 without a sign of failure, although with reduced working time, falls were observed in the abandoned rooms before the next group of rooms were complete.

One might say we continued our roof bolting because we had no alternative. When the Fairview No. 2 mine was started adjacent to No. 1 extremely bad top was encountered. Mining in this section was being carried on by top cutting and putting shear cuts in on 3 ft. center so no shooting was necessary. In spite of this, the roof was so heavy it could not be held on 5" x 7" wood cross-bars. By this time bolted roof in No. 1 mine was showing wonderful results but we were reluctant in starting a second section due to the lack of proper equipment. Faced with not being able to continue work in Fairview No. 2 because of the roof we had no choice but to try bolting. The results were as satisfactory as in Fairview No. 1. No. 2 Section was projected on the block system, with complete extraction of the blocks on one side being made on the advance. This afforded an opportunity to observe the results of bolting in pillar work. The falls come in mass always above the length of the bolts. When the splits were driven open ended the roof showed a tendency to fall prematurely and with little warning. When 4 ft. fenders were left in, the roof stood until the fenders were loaded or shot out. This proved we were making a beam of the top and not anchoring it to a stronger strata and also that the beam could not be cantilevered too far.

To date well over 25,000 bolts have been installed, the majority of which have been 44 inches long and of the split type using the 3/4 x 3/4 x 6

# NEW EQUIPMENT

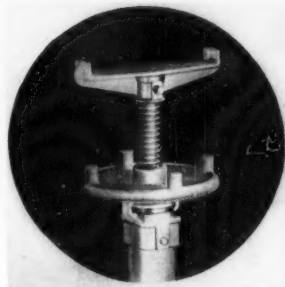
wedge. Although split bolt has always been accepted as the most satisfactory, there are many objections to using it. Until the workers gained skill in drilling the holes to the proper depth often the bolts would protrude too far or there would not be sufficient threads exposed. The latter would require digging sufficient roof to allow the plate and nut to be installed, while the first presented a hazard in that it was possible to bump into them. Also with the split bolts the smallest size practical to split and drive is 1", which means extra cost of material if this size bolt is not necessary. In addition, since it cannot be recovered it is a total loss after using once. The installing of split bolts requires a means of driving, entailing a separate piece of equipment if rotary drilling is used. For these reasons a large number of various type expansions have been tried with varying results. We have installed about 1000 of the newly developed Ohio Brass expansion shields and plugs using  $\frac{3}{4}$  inch diameter 42" bolts, and a few  $\frac{5}{8}$ " by 44 studs. No failures have occurred in either size, although some of our officials are of the opinion the  $\frac{5}{8}$ " will prove too weak for all conditions. This type expansion will enable us to recover the bolt and plate if and when experience shows that this is feasible. At present no attempt is being made to recover any bolts.

There are many advantages in the use of expansions, accompanied naturally, by the new problems in drilling more accurate holes and in getting them to expand at the proper time. Besides the possibility of recovering part of the material, the expansion lends itself to simplifying the job of bolting. Three manufacturers are developing machines that will be capable of drilling vertical holes and will have incorporated in them a nut runner for tightening the nuts or bolts when expansions are used. With the controls at the drilling point, one man will be able to do the complete job in less than 5 minutes.

We have been roof bolting for nearly a year now and have run into and overcome a large number of the problems, but there are still many things that experience alone will answer. So far we have used only 44 and 54 inch bolts. The size plates have been changed from 8"x8"x $\frac{3}{8}$ " to 6"x6"x $\frac{1}{8}$ ". Even so, these may be still too large and heavy for room work and not large enough for entries where slacking causes consider-

(Continued on Page 27)

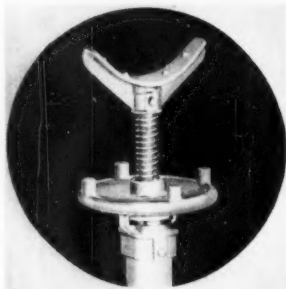
An aluminum alloy mine timbering jack, developed especially for the coal mining industry, is light in weight, yet has a capacity of 16 tons with a safe overload factor. A spinning hand wheel prevents snagging of fingers or catching of clothing or gloves. Weight is 35 to 50% lighter than the conventional steel jack serving the same purpose.



Jack with BJ type head



Jack with type F head.



Jack with type R head.



Jack in service at a Western Pennsylvania coal mine in the Pittsburgh seam.





W. Affelder, Vice President, Hillman Coal & Coke Company, was co-chairman of one of the sessions.



M. H. Forester, Vice President, Pittsburgh Consolidation Coal Company, substituting for Gerald Von Stroh of the Bituminous Coal Research.



J. E. Elkins, General Superintendent, Coal Department, Duquesne Light Company, was co-chairman of the afternoon session.



H. C. Rose, Vice President of Operations, Pittsburgh Coal Company, opened the discussion about continuous mining machine.

## Pittsburgh Section of the American Institute of Mining and Mechanical Engineers Meeting in Off-the-Record Meeting

An off-the-record Meeting of the Pittsburgh Section of the American Institute of Mining and Mechanical Engineers, held in conjunction with the Engineer's Society of Western Pennsylvania, took place in the Monongahela Room of the William Penn Hotel, Pittsburgh, Pennsylvania, on October 28.

The morning session of this meeting which took place at 9:30 a.m. was under the co-chairmanship of W. Affelder, Vice-President, Hillman Coal & Coke Company, and J. A. Younkens, Ass't General Superintendent, Coal Department, Duquesne Light Company. First paper on the program was titled "Performance Of Russelton Cleaning Plant With Full Seam Mining Of Thick Vein Free Port Coal." This paper was presented by J. S. Neill, Engineer, Republic Steel Company. A discussion of this paper was under the direction of D. R. Mitchell, of the



D. L. McElroy, Chief Engineer, Pittsburgh Consolidation Coal Company, was co-chairman of the afternoon session.

Pennsylvania State College. "Economics of Large Diameter Ventilating Bore Holes in Coal Mines" was the next paper, and was presented by Raymond Mancha, Vice President of Ventilation, Joy Manufacturing Company. A discussion of this paper was led by Mr. Frank C. Sturges, Pennsylvania Drilling Company.

The afternoon session opened at 2 p.m. and was under the direction of D. L. McElroy, Chief Engineer, Pittsburgh Consolidation Coal Company and J. E. Elkins, General Superintendent, Coal Department, Duquesne Light Company. The first paper of this session was on "The Analysis For a Continuous Mining Machine." M. H. Forester, Vice President, Pittsburgh Consolidation Coal Company, presented this paper in the absence of Gerald Von Stroh, Mining Development Department, Bituminous Coal Research. H. C.



Frank C. Sturges, Pennsylvania Drilling Company, answering questions about the five foot bore hole being sunk by his company.



W. G. Cooper, Coal Mine Inspector, Lee Siniff, of the Consolidation Coal United States Bureau of Mines, reading a paper on Roof Bolting.



on Roof Bolting in Kentucky.

Rose, Vice President of Operations, Pittsburgh Coal Company, led the discussion of this paper. He pointed out the limited knowledge of the performance of continuous mining machine to date, and the need for a method of carrying coal away from the present continuous mining machine.

W. G. Cooper, Coal Inspector, U. S. Bureau of Mines, read the first of three papers on roof bolting. The second paper on this subject was presented by J. J. Reeves, Superintendent, Renton Mine, Pittsburgh Coal Company. Lee Siniff, of the Consolidation Coal Company, (Ky.) presented the third paper on it.

#### NEW EQUIPMENT

Vascoloy - Ramet Corporation, Waukegan, Illinois, and Carbit, Inc., Pittsburgh, Pennsylvania, have announced new arrangements for sales and service throughout the Eastern coal fields.

The Vascoloy-Ramet Corporation, one of the pioneers in the carbide industry, developed steel cutting grades in the United States. Vascoloy-Ramet has facilities for converting their own ores, and therefore has control of its quality from raw material to finished product. For some time their research has been turned towards development of quality coal cutting carbide grades.

Carbit, Inc., is a pioneer and a major factor in introducing carbide tools to the mining industry. Carbit developed the use of carbide tools in many mines in the Eastern coal fields, and will now sell and service exclusively, Vascoloy-Ramet mining tool products.

It is felt that with the resources of Vascoloy-Ramet, Carbide research, and the expansion of Carbits market, the joining of the above forces will more than facilitate the use of carbide tools in the mining industry.

Carbide coal tool stocks are now carried by the above tool concerns in Pittsburgh, Pennsylvania, and eight other points in the Eastern coal fields.

\* \* \*

A new asbestos quick-seal tamping plug has been placed on the market and is being distributed by the E. I. Du Pont de Nemours & Company, Inc., of Wilmington, Delaware. This plug consists of two pieces: (1) a wooden wedge, cone-shaped and truncated, and (2) a hollow asbestos cylinder, bound in shape by a glued paper band. When wedge is rammed into cylinder by tamping pole, paper band breaks and cylinder expands, giving an air-tight

seal of the borehole.

Holes are drilled and explosives loaded in the usual manner. Select Plug about  $\frac{1}{8}$ " smaller than diameter of borehole at top of charge. Plug with wedge slightly inserted is pushed into hole until it rests against explosive. Tap with tamping pole until ringing sound is heard. This indicates full expansion of Plug. No other stemming is necessary.

Quick-Seal Tamping Plugs seal a borehole in a fraction of the time required to do the job with clay, sand, or dust—save time and cost of handling ordinary stemming materials.

Packed in mesh bags holding 25 plugs, this stemming device is always ready for use—clean, light, convenient, easy to handle.

Reduces hazards in dealing with misfired holes. In case of a misfire, a new primer is placed against orig-

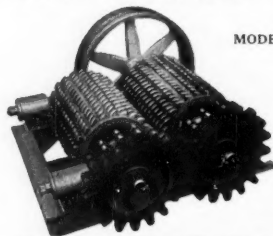


inal plug, resealed with a second plug and fired, detonating the entire charge.

Increases safety in rotational firing—keeps charge in borehole and out of muck pile.

Stems "uppers" as well as horizontal holes. Works equally well in wet or dry holes. Used with either electric detonators or cap and fuse.

## Product Uniformity WITH LESS POWER USED



MODEL NO. 63 STD.



## SCOTSDALE double-roll COAL CRUSHERS

Uniform coal products at a saving in power consumption . . . an actual fact with the Scottsdale double-roll Coal Crusher that features an efficient shredding action on the coal by means of toothed double-rolls assembled in a staggered position.

### The Features . . .

- FORGED STEEL TOOTH GEARS
- WELDED STEEL BASE
- GROOVED FLYWHEEL
- BRONZE BUSHED JOURNAL BEARINGS
- WELDED STEEL HOPPER AND GEAR GUARD

WRITE FOR MORE DESCRIPTIVE LITERATURE

**SCOTSDALE**  
Box 51

Dept. MC

**MACHINE, FOUNDRY &  
CONSTRUCTION CO.**  
Scottsdale, Pa.

## ROOF BOLTING

(Continued from Page 24)

able scaling in hot weather. The cost of drill bits is high and to reduce this cost improvements will have to be worked out on the proper type for the job. The delivery of the three pilot models of roof drilling machine is expected any day, but time will be required to check for bugs, before additional machines can even be built, which means months before the proper machine will be available for additional sections. The original 4 ft. centers between bolts is still being used; it may be that this could or should be changed. The proper widths to be used for entries and rooms is still undetermined. With all these problems and many more too numerous to mention, I can say with pleasure that roof bolting in the Elkhorn No. 3 Seam has resulted in greater safety, increased production, and lower cost, and that in spite of the problems, additional sections are being put onto it as fast as the make-shift equipments we are now using can be obtained, and the men trained in installing bolts.

A new line of custom-built heavy duty compressors, known as Air Chief AIRistocrats, is announced by the Davey Compressor Co., Kent, Ohio.

These compressors are manufactured on special order for users who demand the absolute best in compressor equipment, according to Paul H. Davey, president.

"The AIRistocrat incorporates advanced design and accessory features not available in any standard machine," Mr. Davey said. "We truly believe that it is the Rolls-Royce of the compressor industry."

Production of the custom-built units will be limited to 100 per year

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in 105 and 210 c.f.m. sizes and 50 per year in 160 and 315 c.f.m. capacities, according to Mr. Davey. As its main line, the company will continue to promote and sell its standard Air Chief which is competitive with compressor of other manufacturers. The AIRistocrat is priced approximately \$500 to \$1,000 higher than standard Air Chiefs.

AIRstocrat features include an extra heavy welded steel, vibrationless frame; electric starting; fenders; locking gas cap; hand parking brakes and electric service brakes. The latter can be connected to the braking system of any vehicle used to tow the compressor.

Two hose reels, each of 150 ft. capacity, are provided. Tires are 7:00 x 16, mounted on heavy duty truck wheels. Three lifting hooks, one front and two rear, facilitate attachment or slings for transporting by crane. A tropical radiator guarantees coal engine operation in any climate.

Large, hood-protected, locking tool boxes are located on each side of the trailer. These are 80 inches long, 16 inches wide and 22 inches deep. An additional tool compartment at the rear carries steels up to 10 ft. in length, suspending them beneath the compressor on specially-designed brackets integral with the frame.

At the rear of the unit is a steel platform available for a variety of uses. It can serve as a workbench with vise and tools. Or it provides a foundation for an air hoist or winch.

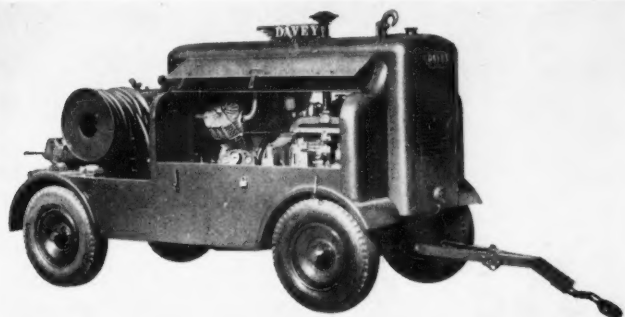
The Model 105 AIRstocrat, pictured, delivers 105 c.f.m. per minute at 100 lbs. pressure. It is 124 inches long, 66 inches wide and 68 inches high. Weight is 4100 lbs.

\* \* \*

Bulletin showing a new Hydraulic Recovery Drill by the Salem Tool Company, Salem, Ohio. The bulletin says that the drill will handle up to 36 inch diameter augers. It also says, "This machine is proving ideal for use by coal strippers where their strip mines become unprofitable. It recovers the exposed coal at the rate of 45 to 110 tons per day. It means a minimum of 15 tons per man per day as this machine only requires a three man crew."

\* \* \*

At Harlan, Kentucky, the Chevrolet team, representing the Blue Diamond Coal Company won first place in the First Aid Contest. The team representing the Colspint Mine of the Consolidation Coal Company (Ky) won first place in Mine Rescue.



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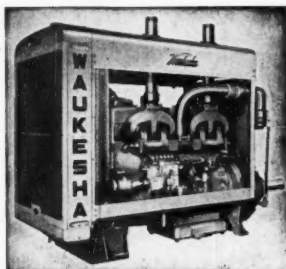
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## PATENTS

The familiar and objectionable click of the wheels of the railway car as they pass over the ordinary joints in the rails will be eliminated by a new type of angular joint for which George A. Standfast, Jefferson City, Mo., received patent 3,472,446. Instead of butting end to end with a square joint, the ends of the rails are cut off at an angle of about 45 degrees and overlap when laid, providing a joint which a wheel does not hit in the same instance.

Somewhat similar joints have been tried but not found satisfactory in service, one reason being that the overlapping was too long. The 45-degree end-cut is claimed to eliminate earlier difficulties. Also, in the new joint, the toe or corner portions of the rail flanges are cut back for an inch to remove sharp points and make the rails safer to handle.

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Motors 220/440 v. or 2200 v.—3 ph., 60 cy.

No.	KW	Make	RPM
3	250	Westinghouse	1200
1	200	Westinghouse	720
2	200	Westinghouse	1200
1	100	Westinghouse	700
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1	100	Westinghouse	600
1	100	General Electric	1800
1	100	Reliance	588
1	100	Delco	1200
2	90	Westinghouse	680
4	75	Westinghouse	720
1	75	Westinghouse	1200
1	60	Westinghouse	1200
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3	40	Westinghouse	960
2	30	Westinghouse	720

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1—100 kw. G.E. 125 v. 900 rpm. 220/440 v.  
1 3 ph. 60 cy. AC Syn.  
1—125 kw. G.E. 125 v. 1200 rpm. 220/440 v.  
1 3 ph. 60 cy. AC.

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No.	KW	Make	Speed
1	250	West.	1200
1	175	G. E.	700
3 New	135	G. E.	1150
1	125	West.	560
1	125	Allis-Chal.	1150
1	110	West.	700
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**A.C. Generators—220/4000/440/220 v.**  
No. KW Make Speed  
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A feature of the construction is a structural frame that straddles one of the recesses in the cylinder head normally occupied by a fuel injector, and anchors securely to the studs flanking the opening. This gives rigidity. Patent 2,471,746 was awarded to Rudolph Hilbert, Salt Lake City, Utah, for this invention.

\* \* \*

"Working on the railroad" almost automatically conjures up pictures of big gangs of men doing things the hard way—setting and tamping ties, spiking rails, bolting their ends together. But when you are confronted with the dilemma of a vast deal of railroad rebuilding and a shortage of manpower, prefabrication and mechanized assembly seems the rational solution.

That is what is undertaken in the track-laying system devised by a French engineer, A.L.C. Blondelle of Sartrouville, to whom U. S. patent 2,458,050 has just been granted here. His track-layer consists essentially of a low-clearance Gantry crane mounted on a special car. Factory-assembled sections of track, complete with rails and ties, are fed up to it from a car behind; the crane moves the track, a section at a time, out in front, and after it has been set in place by a ground crew moves out on it to repeat the process.

Rights in the patent are assigned to the process.

Rights in the patent are assigned to the Societe Entreprises Metropolitaines et Coloniales, S. A.

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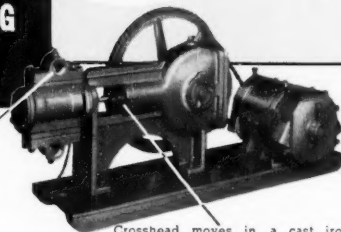
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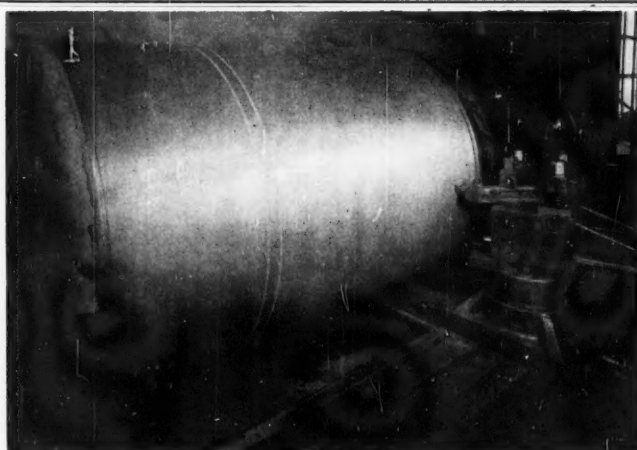
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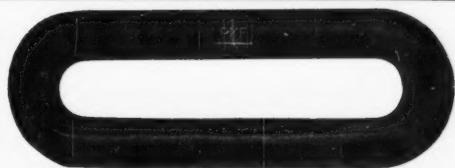
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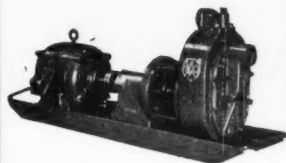


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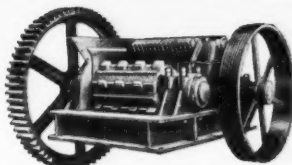
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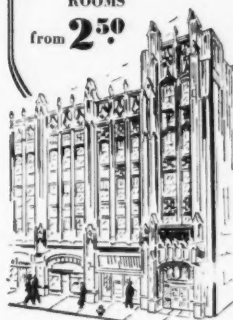
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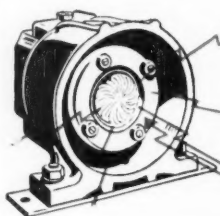
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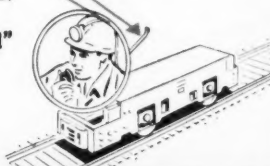


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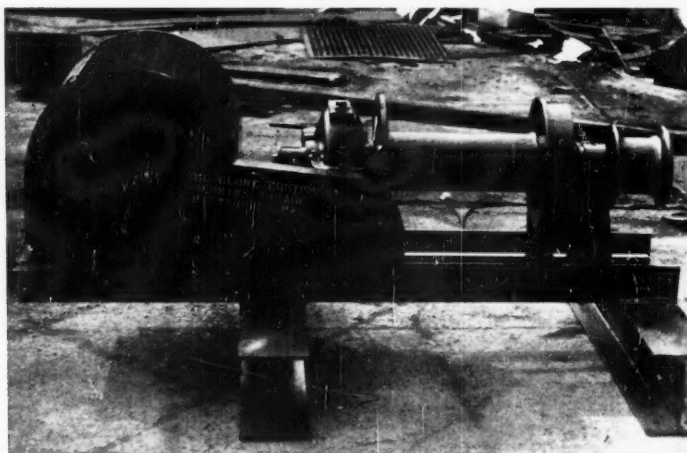
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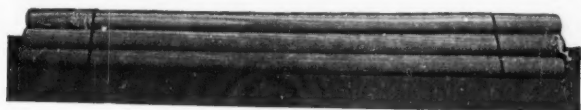
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No. 20 Powder Box...	\$ 3.10	"	No. 6 Cap Box...	\$ 1.70	"
No. 25 Powder Box...	\$ 4.20	"	Size 2 1/4" x 3" x 6" Inside		
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**CLEVELAND-LE ROI** - Air  
Tools

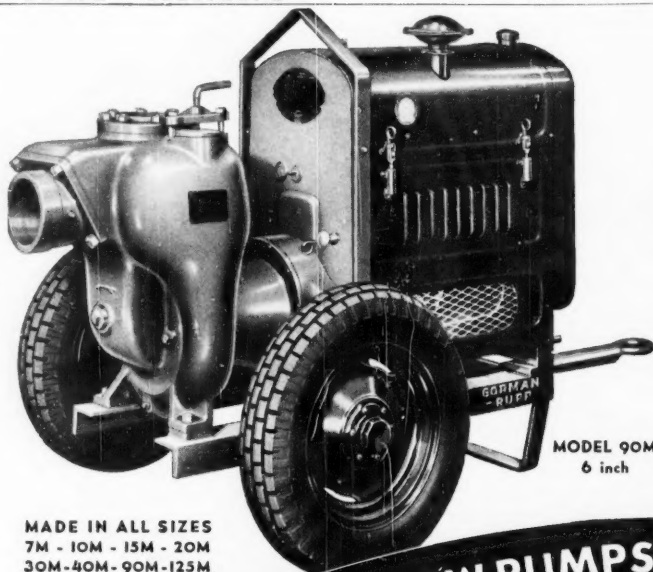
**BRIGGS & STRATTON** - En-  
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Visit Our New Location

# ARROW SUPPLY CO.

**3600-3616 LIBERTY AVE.  
PITTSBURGH 1, PA.**

Phone MUsem 1-1555-6-7



**MODEL 90M**  
6 inch

MADE IN ALL SIZES  
7M - 10M - 15M - 20M  
30M - 40M - 90M - 125M

## GORMAN-RUPP'S NEW PUMPS

### CHALLENGE ANY PUMP TO MATCH THEIR PERFORMANCE

With a new complete line of Contractors' Pumps, Gorman-Rupp has topped their own past high record of performance with a better pump --

- .. QUICKEST PRIMING
- .. HIGHEST PRIMING
- .. PUMPS MORE DIRTY WATER

Compare them for priming speed:

The new Model 15M (3") primes at 25 ft. suction lift in 61 seconds.

The new Model 90M (6") primes at 25 ft. suction lift in 44 seconds.

And the Gorman-Rupp is still the most simple pump --

No ports, no valves, no clean-out plates, nothing to cause stoppages.

Write for the new Contractor's  
Bulletin 8-CP-11

#### THE GORMAN-RUPP

#### Guarantee

Our distributor's are authorized to put a Gorman-Rupp Contractor's Pump on any pumping job, anytime, anywhere, alongside any other make pump, size for size. The Gorman-Rupp pump is guaranteed to pump more dirty water, more hours, using less gasoline, to prime quicker and at higher suction lifts than any other self-priming pump. If it isn't the best all around pump, our distributor will accept the return of the Gorman-Rupp pump and pay the user any installation expense incurred.

**THE**



**GORMAN-RUPP COMPANY**

MANSFIELD, OHIO

# Here's how they "Shovel" Light and Power into American Cities



*Photo of Mitchell Station, West Penn Power Co., Pittsburgh, Pa.*

**Remember back** when the brawniest men in town were the fellows who stoked the powerhouse boilers? Well, today they wear uniforms or business clothes, and sit quietly alert, like the men shown above. For from the control panels around them, they not only operate the turbines providing a city with light and power, they also feed giant furnaces with powdered coal—at the twist of a wrist.

Today, in many factories, central heating plants and huge electric generating stations throughout the country, specially prepared coals are helping to deliver more heat and more kilowatt-hours per ton. Indeed, mine operators have built million-dollar preparation plants, where coal is washed, graded, blended and treated to meet the requirements of every type of combustion equipment.

In modern equipment, coal is making possible the generation of as much as 750,000 lbs. of steam per hour from a single boiler. No wonder coal is now being used to generate almost two-thirds of America's electric power.

**Modernizing** America's bituminous coal mines means replacing "pick and shovel" mining with machines. Today more than 91% of production is mechanically cut and 64% is mechanically loaded. And among many new preparation plants now under construction is one designed to wash and grade coal for specific uses at a record rate of 2,000 tons an hour.

Largely as a result of modernization by progressive management, the American miner's average daily output is five times greater than that of the British miner and his take-home pay is higher than that paid by any other major American industry.

## **BITUMINOUS COAL**

**BITUMINOUS COAL INSTITUTE**

A DEPARTMENT OF NATIONAL COAL ASSOCIATION

WASHINGTON, D. C.

**BITUMINOUS COAL . . . LIGHTS THE WAY . . . FUELS THE FIRES . . . POWERS THE PROGRESS OF AMERICA**

# WHY WALK—

## WHEN YOU CAN RIDE A TJI "MINE JEEP"?

**SAFE and FAST TRANSPORTATION IS YOURS**

The Lee-Norse Mine Jeep can be used to pull a variety of special units. The combination battery trolley Jeep makes it particularly suited for pulling fire fighting equipment.

When an ambulance is needed for emergency, the Lee-Norse Jeep is easily convertible.

The Lee-Norse Jeep pulls man trip cars, thereby cutting travel time and providing each section crew with independent transportation.



PULLING FIRE PUMPER



AS AN AMBULANCE



PULLING MAN TRIP

PLEASE WRITE FOR BULLETIN AND COMPLETE INFORMATION

*Lee-Norse Company*